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Indian Standard

“पुनः १९८०”

SPECIFICATION FOR
FLAT GLASS OIL LEVEL GAUGES FOR OIL STORAGE TANKS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR FLAT GLASS OIL LEVEL GAUGES FOR OIL STORAGE TANKS

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Indian Standard

SPECIFICATION FOR FLAT GLASS OIL LEVEL GAUGES FOR OIL STORAGE TANKS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 21 July 1971, after the draft finalized by the Chemical Engineering Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 In the preparation of this standard considerable assistance has been derived from JIS F 7215-1960 'Marine flat glass oil level gauges', issued by the Japanese Standards Association.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies requirements for flat glass oil level gauges for use on fuel tanks storing fuel of a flash-point over 65°C.

2. CLASS AND TYPE

2.1 The oil gauges shall be of six types as given in Table 1.

3. DIMENSIONS AND OTHER CONSTRUCTION DETAILS

3.1 Dimensions, shape and assembled weight (calculated) shall be as given in Tables 2 to 4 read with Fig. 1 to 3.

3.1.1 Dimensions not given are left to the discretion of the manufacturer.

4. MATERIAL

4.1 Materials used in the construction of the various components of the gauge glass shall be of a quality not less than those specified in 4.1.1 to 4.1.3.

*Rules for rounding off numerical values (*revised*).

4.1.1 The upper and lower block of the gauge shall conform to Grade 20 of IS : 210-1962* and the cover shall conform to Grade St 42 of IS : 226-1969†.

4.1.2 The gauge glass shall conform to the dimensions given in Fig. 2 and shall be of the flat thorough-vision type gauge glass or the flat reflex type gauge glass given in IS : 5428 (Part I)-1969‡.

4.1.3 Material used for the other parts shall conform to the requirements given in part list (see Table 5 and Fig. 4).

5. DESIGNATION

5.1 Oil level gauges shall be designated by the name, type, number and length of gauge glass or the mark and the number of this specification as given below:

Examples:

1. Oil level gauge having lower block of Type L2L, upper block of Type U2 and 4 flat thorough-vision type gauge glasses of length 320 mm shall be designated as:

Flat Glass Oil Level Gauge, L2L × U2 (4 × F_A320), or
FG—L2L × U2 (4 × F_A320)

↓
To show number
and designation of
gauge glass

↓
To show the type of
upper block

↓
To show the type of lower block

2. Oil level gauge having lower block of Type L2L, upper block of Type U2 and 4 flat reflex type gauge glasses of length 320 mm shall be designated as:

Flat Glass Oil Level Gauge, L2L × U2 (4 × F_R320), or
FG—L2L × U2 (4 × F_R320).

6. INSPECTION

6.1 The gauges shall be subjected to the following inspection and test and shall satisfy all the requirements specified.

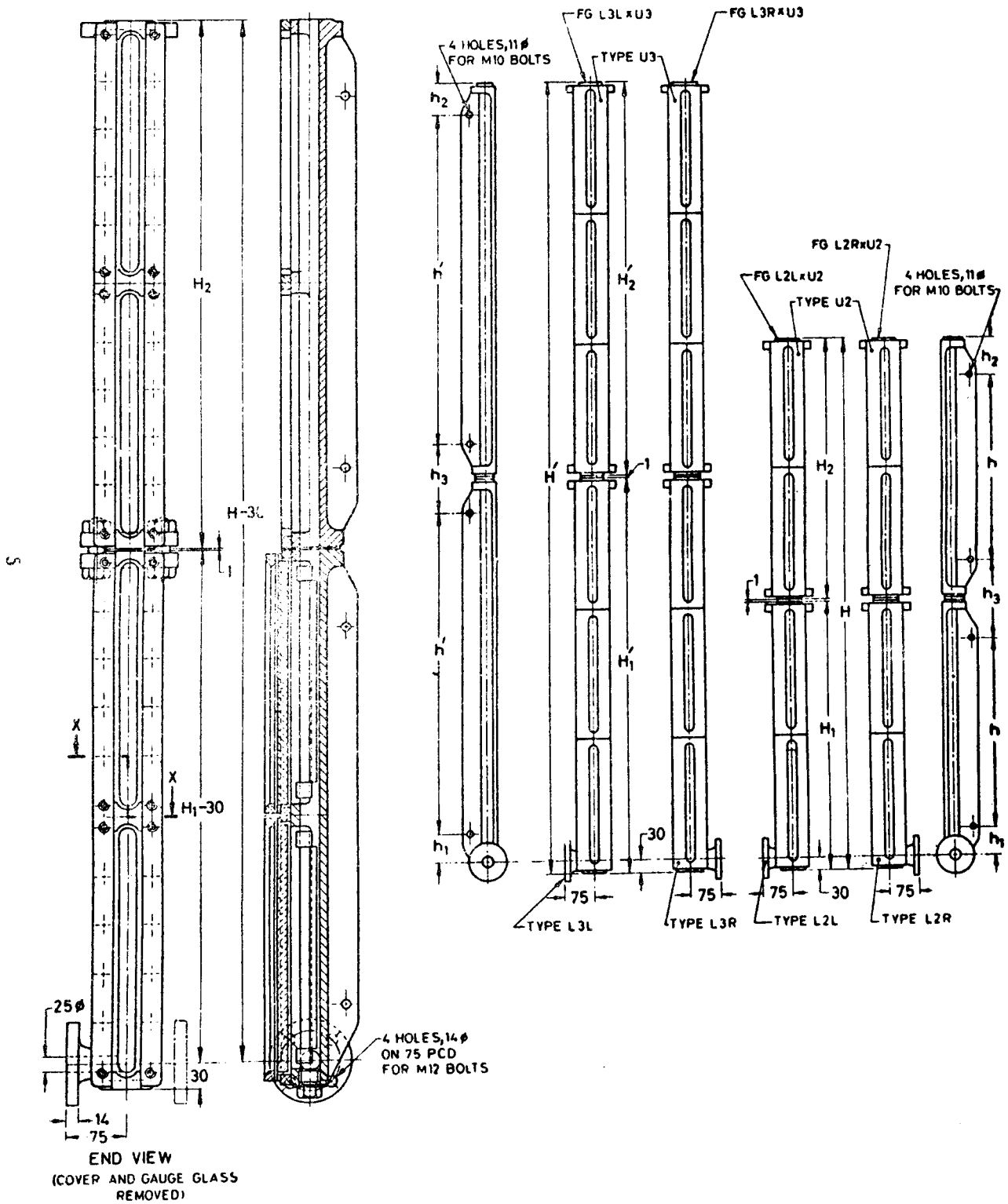
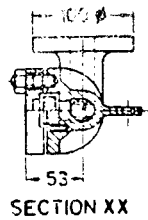
6.1.1 Visual Inspection—The products shall be free from external visual defects.

6.1.2 Dimensional Check—The dimensions of each component shall be suitable for insertion of the gauge glass.

*Specification for grey iron castings (*revised*). (Since revised).

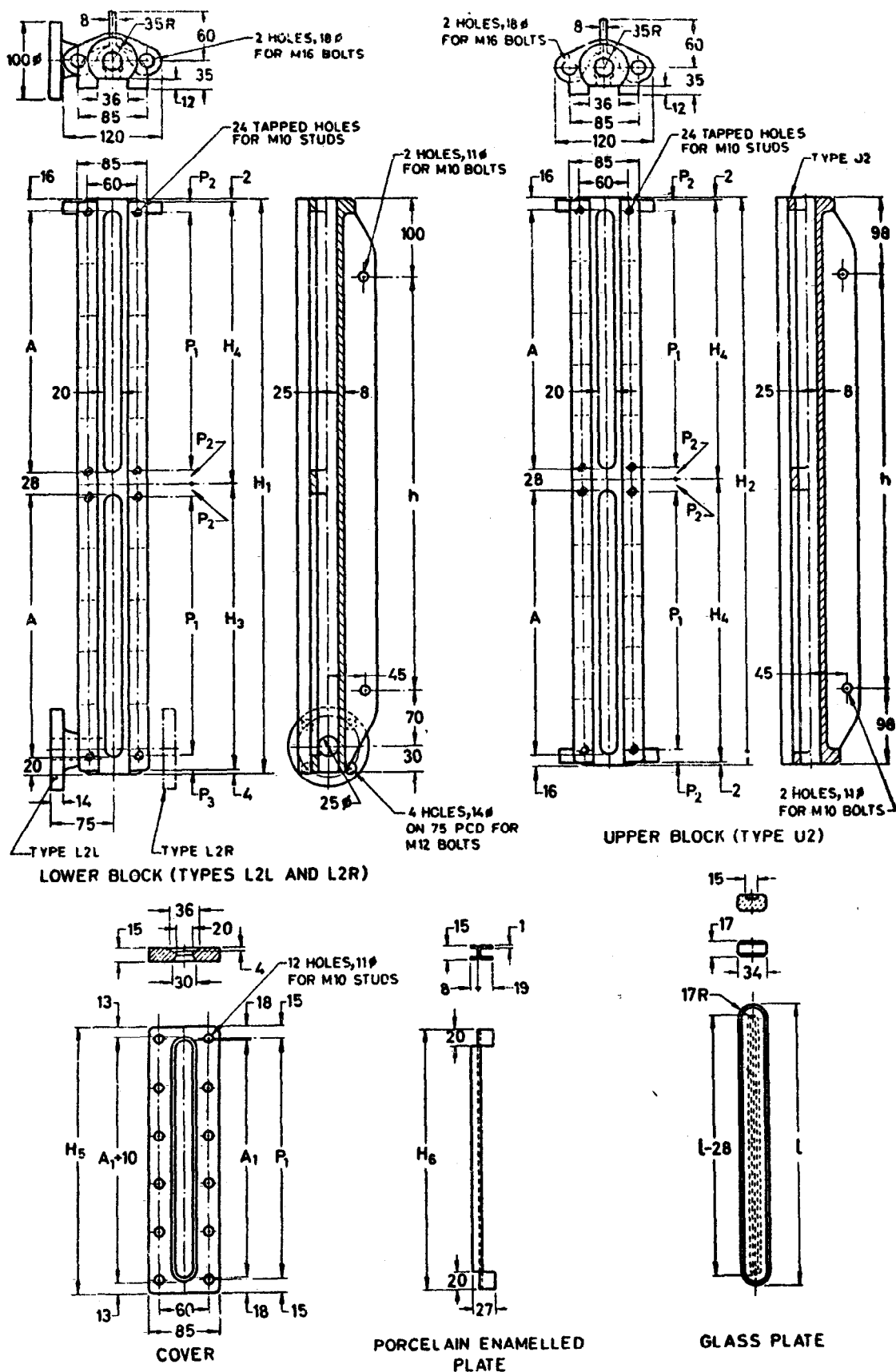
†Specification for structural steel (standard quality) (*fourth revision*).

‡Specification for gauge glasses for pressure vessels and boilers: Part I Gauge glasses.



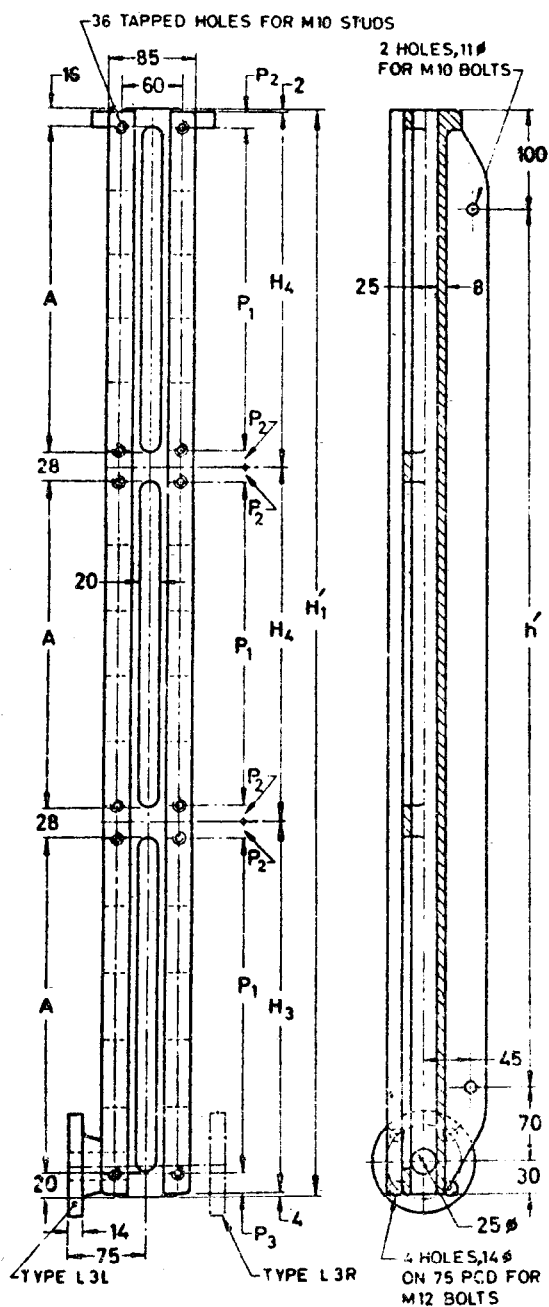
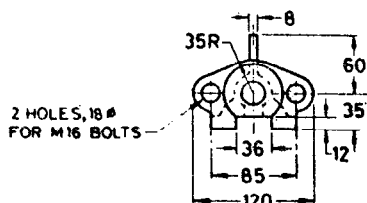
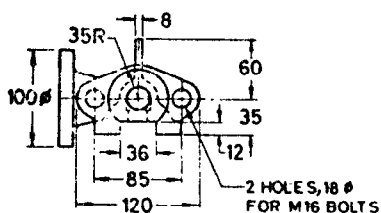
All dimensions in millimetres.

FIG. 1 LENGTH OF FITTED DIMENSIONS OF FLAT GLASS OIL LEVEL GAUGES

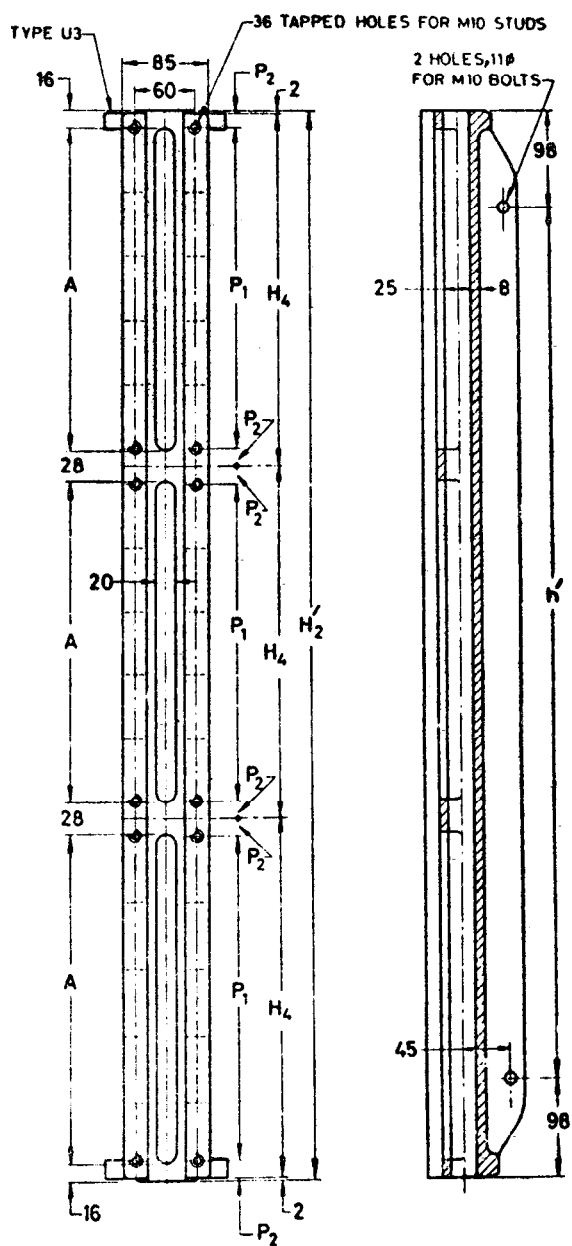


All dimensions in millimetres.

FIG. 2 DETAIL DIMENSIONS FOR COMPONENTS OF FLAT GLASS OIL LEVEL GAUGES



LOWER BLOCK (TYPES L3L AND L3R)



UPPER BLOCK (TYPE U3)

All dimensions in millimetres.

FIG. 3 DETAIL DIMENSIONS FOR COMPONENTS OF FLAT GLASS OIL LEVEL GAUGES

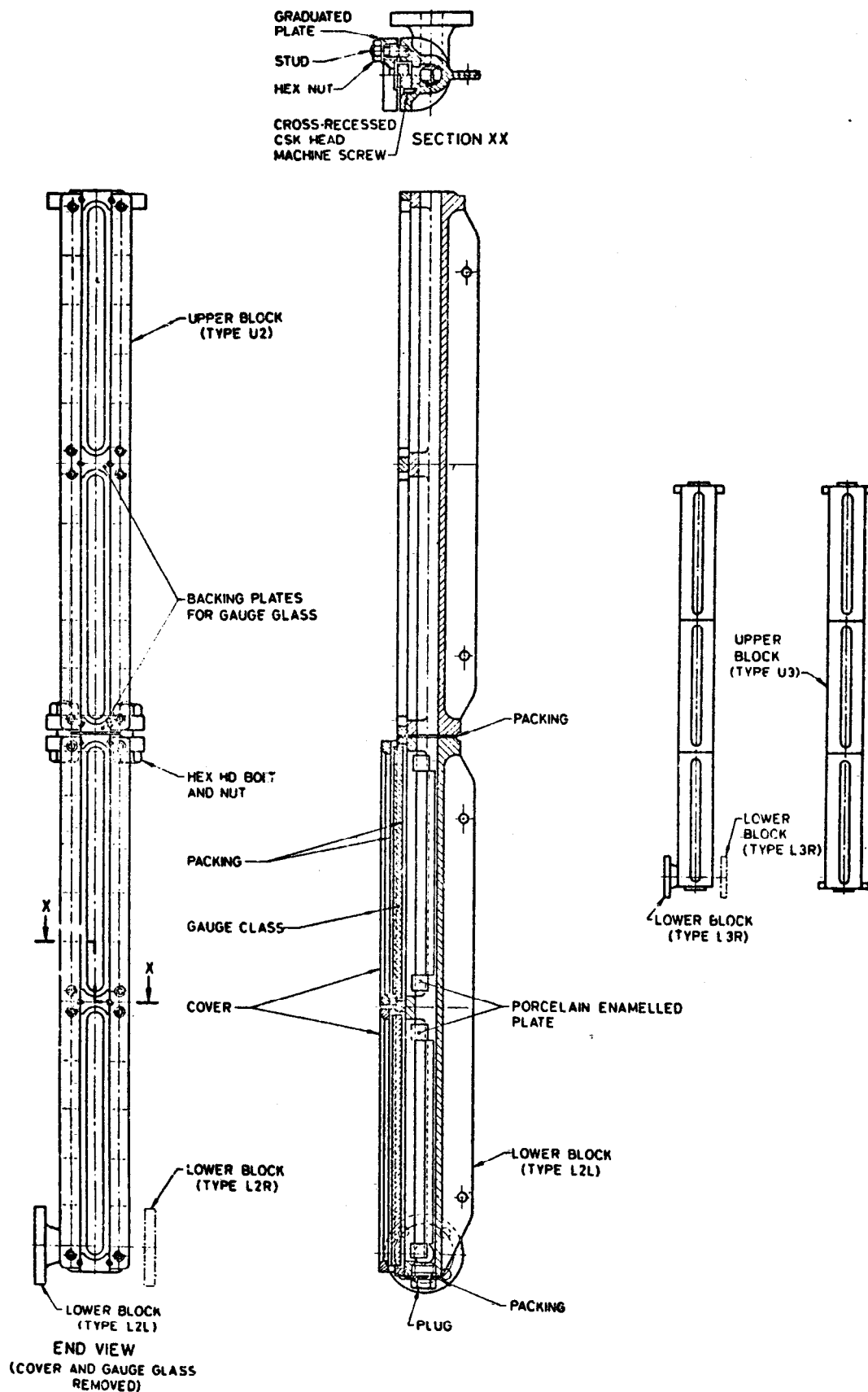


FIG. 4 NOMENCLATURE FOR FLAT GLASS OIL LEVEL GAUGES

TABLE 1 TYPES OF OIL LEVEL GAUGES

(Clause 2.1)

CLASS	TYPE	NUMBER OF GLASS	REMARKS
Lower block	L2L L3L	2 3	Flange of the left-hand direction for facing the tank
	L2R L3R	2 3	Flange of the right-hand direction for facing the tank
U ₁ per block	U2	2	—
	U3	3	

TABLE 2 LENGTH OF FITTED DIMENSIONS OF FLAT GLASS OIL LEVEL GAUGES

(Clause 3.1 and Fig. 1)

All dimensions in millimetres.

LENGTH OF GAUGE GLASS	FGL2L × U2 or FGL2R × U2				FGL3L × U3 or FGL3R × U3						
	H	H ₁	H ₂	h	H'	H ₁ '	H ₂ '	h'	h ₁	h ₂	h ₃
320	1 337	670	666	470	1 999	1 001	997	801	70	98	199
340	1 417	710	706	510	2 119	1 061	1 057	861	70	98	199

NOTE — Lower block and upper block may be used in suitable combination to meet specific requirement.

TABLE 3 ASSEMBLED WEIGHT OF FLAT GLASS OIL LEVEL GAUGES

(Clause 3.1)

LENGTH OF GAUGE GLASS (mm)	WEIGHT (kg) FOR TYPES					
	FGL2L × U2 FGL2R × U2	FGL3L × U3 FGL3R × U3	Type L2L Type L2R	Type L3L Type L3R	Type U2	Type U3
320	35.12	51.45	17.95	26.10	17.17	25.35
340	37.11	54.03	18.90	27.36	18.21	26.67

TABLE 4 DETAIL DIMENSIONS FOR COMPONENTS OF FLAT GLASS OIL LEVEL GAUGES

(Clause 3.1, and Fig. 2 and 3)

All dimensions in millimetres.

GAUGE GLASS DESIG- NATION	LOWER AND UPPER BLOCKS											COVER	PORCE- LAIN ENAM- ELLED PLATE	STUD						
	Types L2L, L2R and U2			Types L3L, L3R and U3										Number				Cover	Size	
	<i>l</i>	<i>H</i> ₁	<i>H</i> ₂	<i>h</i>	<i>H</i> ' ₁	<i>H</i> ' ₂	<i>h</i> '	<i>H</i> ₃	<i>H</i> ₄	<i>A</i>	<i>H</i> ₅	<i>A</i> ₁		<i>H</i> ₆	<i>P</i> ₁	<i>P</i> ₂	<i>P</i> ₃			Types L2L, L2R and U2
FA 320 FR 320	320	670	666	470	1 001	997	801	333	331	303	330	294	293	300	15.5	17.5	24	36	12	M10
FA 340 FR 340	340	710	706	510	1 061	1 057	861	355	351	323	350	314	313	320	15.5	17.5	24	36	12	M10

TABLE 5 PART LIST AND THE APPLICABLE SPECIFICATIONS FOR THE MATERIALS FOR THE OIL LEVEL GAUGE (see Fig. 4)

(Clause 4.1.3)

No.	NAME OF PARTS	MATERIAL GRADE/ PROPERTY CLASS	APPLICABLE STANDARD
1.	Lower block (Type L2L)	Grade 20	IS : 210-1962*
2.	Lower block (Type L2R)	Grade 20	IS : 210-1962*
3.	Lower block (Type L3L)	Grade 20	IS : 210-1962*
4.	Lower block (Type L3R)	Grade 20	IS : 210-1962*
5.	Upper block (Type U2)	Grade 20	IS : 210-1962*
6.	Upper block (Type U3)	Grade 20	IS : 210-1962*
7.	Cover	Grade St 42	IS : 210-1962*
8.	Backing plate for glass	Grade St 42	IS : 226-1969†
9.	Porcelain enamelled plate	Grade St 42	IS : 226-1969†
10.	Stud	Class 4-6	IS : 1862-1967‡
11.	Hexagon nut	Class 4	IS : 1364-1967§
12.	Cross-recessed countersunk head machine screw	Class 4-6	IS : 1365-1968
13.	Hexagon bolt	Class 4-6	IS : 1364-1967§
14.	Plug	—	—
15.	Graduated plate	—	—
16.	Flat gauge glass	—	IS : 5428 (Part I)- 1969¶
17.	Packing	—	IS : 4687-1968**

*Specification for grey iron castings (revised). (Since revised).

†Specification for structural steel (standard quality) (fourth revision).

‡Specification for studs (first revision).

§Specification for precision and semi-precision hexagon bolts, screws, nuts and lock nuts (dia range 6 to 39 mm) (first revision).

||Specification for slotted countersunk head and slotted raised countersunk head screws (dia range 1.6 to 20 mm) (second revision).

¶Specification for gauge glasses for pressure vessels and boilers: Part I Gauge glasses.

**Specification for gland packing asbestos.

6.1.3 Hydraulic Test — After completion of assembly, the gauge shall be subjected to a hydraulic pressure of 5 kgf/cm^2 without showing any defect or other signs of failure.

7. MARKING

7.1 The following information shall be stamped on the surface of the block rib of the oil level gauge:

- a) Type of oil level gauge,
- b) Manufacturer's name or mark or other identification, and
- c) Any other marking required by the purchaser.

7.1.1 It may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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